

## CLAIMS

1. A device, comprising:
  - a cup, a base of which is oriented in the direction of the force of gravity,
  - 5 and an opening region of which is oriented in the opposite direction to the force of gravity, and wherein said cup is heatable directly or indirectly by a heating, temperature-measuring control unit;
  - a substance-adding unit having a substance feedline and a metering unit, the substance-adding unit being oriented with a substance outlet in the direction of
  - 10 the force of gravity and projecting into a free volume of said cup between said base and said opening region;
  - a reactor casing; and
  - an outlet for a gaseous product.
- 15 2. The device as claimed in claim 1, wherein said cup, said substance-adding unit or both can be raised and lowered in the direction of the force of gravity by at least one lifting device.
- 20 3. The device as claimed in claim 1, wherein a turbulence barrier is connected upstream of said outlet.
4. The device as claimed in claim 1, wherein a gas-conveying unit is connected downstream of said outlet.
- 25 5. The device as claimed in claim 4, wherein a dust separator is connected upstream, downstream or both of said gas-conveying unit.
6. The device as claimed in claim 1, wherein said substance-adding unit is equipped with a temperature detector in the region of said substance outlet.
- 30 7. The device as claimed in claim 1, wherein said substance-adding unit comprises a solid to be thermally decomposed, quartz glass or a metallic material.

8. The device as claimed in claim 1, wherein said cup comprises a solid to be thermally decomposed, has a side height of 10 to 200 cm and a base area of from 10 to 10,000 cm<sup>2</sup>.

5            9. The device as claimed in claim 1, wherein said cup and a lance of said substance-adding unit comprise high-purity silicon.

10           10. The device as claimed in claim 1, wherein said cup comprises a silicon disk as said base, and  
a silicon tube as a wall of said cup;  
wherein said silicon tube has two opening surfaces;  
wherein said silicon tube stands substantially vertically based on one of said two opposite opening surfaces of said silicon tube, on a planar surface of said silicon disk; and  
15           wherein an external diameter of said silicon tube is less than or equal to a diameter of said silicon disk.

11. The device as claimed in claim 10, wherein said silicon disk is a wafer.

20           12. The device as claimed in claim 1, wherein said cup, at the level of said opening region, is covered with a plate which, in the center, has a passage for said substance-adding unit.

25           13. The device as claimed in claim 1, which is equipped with at least one flap which closes in a gastight manner or a cover which closes in a gastight manner as part of said reactor casing.

14. The device as claimed in claim 1, wherein said reactor casing is equipped with a cooler and, optionally, a heater.

30           15. The device as claimed in claim 1, wherein said reactor casing is pressure-resistant and vacuum-resistant.

16. The device as claimed in claim 1, which is gastight.

17. A process for depositing a solid (B), comprising:  
heating the base, the wall or both of said cup of the device according to  
claim 1;  
5        introducing a gaseous substance (A) an interior of said cup via said  
substance-adding unit;  
thermally decomposing a gaseous substance (A), thereby forming said solid  
(B) and at least one gaseous product (C) and depositing said solid (B) substantially  
on an inner side of said cup; and  
10        removing said gaseous product (C) from said device system through said  
outlet;  
wherein said substance (A) has a higher density than said gaseous product  
(C).
- 15        18. The process as claimed in claim 17, wherein said device is evacuated  
and/or deliberately filled with a gas or gas mixture, each of which have a lower  
density than said gaseous substance (A), before the gaseous substance (A) is  
added.
- 20        19. The process as claimed in claim 17, wherein said substance (A) is  
monosilane ( $\text{SiH}_4$ ).
- 25        20. The process as claimed in claim 17, wherein said substance (A) is  
silane ( $\text{SiH}_4$ ) mixed with a member selected from the group consisting of  
hydrogen, nitrogen, gaseous ammonia, argon, helium and mixtures thereof.
- 30        21. The process as claimed in claim 17, wherein the heating of said cup (1)  
establishes a temperature which is higher than a decomposition temperature of  
monosilane.
22. The process as claimed in claim 17, which is carried out at reduced  
pressure, at elevated pressure or at standard pressure and at a temperature of  $\geq 400$   
up to  $1200^\circ\text{C}$ .

23. The process as claimed in claim 17, wherein said reactor casing is cooled.

5 24. The process as claimed in claim 17, wherein said substance outlet projects into the free volume of said cup between said base and said opening region, and the orientation of said substance outlet with respect to said base of said cup is controlled and tracked by a temperature detector.

10 25. The process as claimed in claim 17, wherein a pressure in said device and in a feed of said substance (A) are controlled by the discharge of said gaseous product (C) through said gas-conveying unit and/or by said metering unit.

15 26. The process as claimed in claim 17, wherein a substantially homogeneous body in ingot form comprising said solid (B) is produced by thermally decomposing said substance (A) in said cup.

27. The device as claimed in claim 2, wherein a turbulence barrier is connected upstream of said outlet.